



# City of Milpitas

## Invitation for Bids to FURNISH STORMWATER PUMPING UNITS at BERRYESSA STORMWATER PUMP STATION

Project No. 8138

City of Milpitas  
Purchasing Division  
455 E. Calaveras Blvd.  
Milpitas, CA 95035  
(408) 586-3161  
Fax (408) 583-3170

Date of Issuance: May 4, 2005  
Bid Deadline: May 24, 2005  
2:00 P.M.

## NOTICE INVITING BIDS

Notice is hereby given that the City Clerk of the City of Milpitas, Milpitas, California, shall receive sealed bids at the Public Services Counter, Milpitas City Hall, 455 E. Calaveras Boulevard, until 2:00 p.m. on May 24, 2005, and that bids will be opened in public at or about that hour at City Hall.

Bids are hereby requested for furnishing vertical turbine storm water pumping units as indicated and specified in this document. The pumping units shall replace existing equipment at the City of Milpitas' Berryessa Stormwater Pump Station, located on Folsom Circle at Hidden Lake Park off North Milpitas Boulevard in the City of Milpitas, California.

Four pumping units shall be furnished, as follows:

- Three vertical turbine pumps with a rated capacity of 20,000 gallons per minute (GPM) at 23.4 feet of head, suitable for operation with variable speed drive equipment. Pump shall be driven by Caterpillar diesel engines with variable speed drives through right-angle gear assemblies.
- One vertical turbine pump with a rated capacity of 5,000 GPM at 40.0 feet of head, suitable for operation with variable speed drive equipment. Pump drive shall be a vertical, solid shaft, drip-proof, squirrel-cage induction motor controlled by a variable frequency drive.

Bidder shall:

- Furnish pumps, diesel engines, right-angle drives, electric motor, bedplates, and all accessories required to make the pumping units fully operational, including lifting attachments, lubricators, pressure gages, and fuel/drainage connections.
- Be responsible for complete unit assembly.
- Conduct appropriate factory tests on engines, motor, drives, and pumps.
- Furnish guaranteed performance curves for each pumping unit and submit certified shop and working drawings for equipment and accessories, as well as data regarding pump and driver characteristics and performance.
- Coordinate delivery of equipment with the City's representative and deliver equipment to the Berryessa Stormwater Pump Station or to a temporary storage location, as directed by the City Engineer.
- Coordinate efforts with Contractor responsible for general pump station improvements and equipment installation.
- Certify that installation is in compliance with manufacturer's recommendations.
- Provide startup services, acceptance tests, operator training, and Operations and Maintenance manuals.
- Have a minimum 10 years experience with providing, coordinating installation and providing startup services of units of similar size and complexity as those specific herein.

The equipment delivered by Bidder shall be installed by a separate contractor (Contractor) with overall responsibility for general pump station improvements and equipment installation. Bidder shall coordinate equipment delivery with City Engineer and Contractor. Bidder shall also provide clear instructions to Contractor before and if necessary during the installation process. Bidder is ultimately responsible for the functionality and satisfactory performance of equipment furnished.

All similar pumping units shall be furnished by a single manufacturer. Pumping units and drivers and accessories shall be delivered to the site ready for installation no later than September 5, 2005. Acceptance testing must be completed no later than October 14, 2005 unless otherwise directed by the City Engineer.

Bidders will be required to demonstrate to the satisfaction of the City Engineer that they possess the necessary qualifications and have the ability and financial resources to furnish, make operational, and test the storm water pumping units requested herein.

Proposal must be accompanied by bid bond.

Contractors bidding the project are strongly encouraged to attend a pre-bid conference prior to bidding. The prebid conference is scheduled for Tuesday, May 17, 2005, at 10:00 a.m. at Berryessa Stormwater Pump Station on Folsom Circle at Hidden Lake Park off Milpitas Boulevard Milpitas, CA. 95035 .

All proposals or bids must be made upon the proposal form included in the Bid Documents. They must be sealed and addressed to the City Clerk of the City of Milpitas and must be plainly endorsed as follows:

Bidder's Name, Address, Project Name, Project #

Bids are invited on a lump sum basis for the four pumping units. The City Council reserves the right to reject any or all bids.

Notice also is hereby given that in accordance with Section 1773.2 of the Labor Code of the State of California, copies of the general prevailing rate of per diem wages in the locality in which the public work is to be performed for each craft, classification, as determined by the Director of the Department of Industrial Relations are on file in the Office of the City Engineer. It shall be mandatory upon the Bidder to whom the contract is awarded, and upon all subcontractors under the Bidder, to pay not less than the highest of the applicable rates set forth in either the federal or municipal schedules of prevailing wage rates.

Employer payments other than those itemized therein, as defined in Section 1773.1 of the Labor Code, are to be paid in accordance with the terms of the collective bargaining agreement applicable to the type of classification of the worker employed on the project, including overtime, Sunday and holiday pay.

Pursuant to the provisions of Public Contract Code Section 22300, and at the request and expense of the Bidder, securities equivalent to the amount withheld by City to ensure performance under a contract shall be deposited with City and with a State or Federally chartered bank as escrow agent who shall pay such monies to the Bidder upon satisfactory completion of the contract. Eligible securities shall include those listed in Government Code Section 16430 or bank or savings and loan certificates for deposit. The Bidder shall be the beneficial owner of said security and shall receive any interest thereon.

Proposals will be reviewed by the City Engineer and scheduled to be presented to the City Council at the meeting of June 7, 2005 or thereafter at which time the Council may accept or reject bids.

For general and legal requirements concerning the work, see the General Conditions and the Special Conditions, and for Specific Requirements, see the Technical Provisions. For document precedence, see Section C-12.

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Chris Schroeder, Purchasing Agent

Published: \_\_\_\_\_

## **BID SHEET**

A cost breakdown of the lump sum Base Bid price is mandatory, in accordance with the provisions of the Contract Documents. The breakdown shall be used for analyzing the Bidder's proposal and bid schedule, and for application for payment. Unit costs shall include all work. The sum of items 1 and 2 should equal the Total Base Bid Amount. The contract will be awarded on the basis of the lowest bid price on the Total Base Bid Amount.

### **Item No. 1 – Main Pumping Units**

Unit costs to include all necessary accessories, submittals, delivery, testing, training, O&M Manuals.

Item	Unit Cost	Quantity	Total Cost
Vertical turbine pumps		3	\$
Diesel engines, including transmissions and couplings to right-angle drives		3	\$
Right-angle drives		3	\$

Lump Sum Price \$

### **Item No. 2 – Jockey Pump**

Unit costs to include all necessary accessories, submittals, delivery, testing, training, O&M Manuals.

Item	Unit Cost	Quantity	Total Cost
Vertical turbine pump		1	\$
Electric motor		1	\$

Lump Sum Price \$

**Total Base Bid Amount (Item No. 1 + Item No. 2)** **\$ \_\_\_\_\_**

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Signature of Authorized Bidder's Representative Date

Name

Address

Telephone

TERM OF OFFER

It is understood and agreed that this bid may not be withdrawn for a period of ninety-(90) days from the Bid Submittal Deadline, and at no time in the case of the successful Bidder.

1. The successful bidder shall be required to submit bid, labor & materials, and performance bonds as specified in the General Conditions. All required bonds are to be calculated on the maximum total purchase price (100%) of the bid amount.
2. Licensed contractors: All contractors bidding/proposing work requiring a license by the State of California must demonstrate under penalty of perjury that they are licensed contractors by listing their license number and date of expiration immediately below:

Contractors License number

Date of Expiration

Type of License

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3. The successful bidder shall furnish to the City a Certificate of Insurance for General Liability, Auto and proof of Workers Compensation Insurance for all employees, as further specified in the General Conditions.
4. Listed below is the name of each subcontractor who will perform or render service to the undersigned in or about the installation work herein described and portions of said work, which will be done by each subcontractor in accordance with sections 4100 and 4108 of the government code, State of California.

SUBCONTRACTOR

BUSINESS ADDRESS

PORTIONS OF WORK

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Name of Company

Printed name of Officer

Address

Signature

City, State, Zip

Telephone Number

Date

Fax Number

Email Address of Direct Contact Person

## SAMPLE CONTRACT

At Milpitas, California, the \_\_\_\_ day of \_\_\_\_\_, 2005, the CITY OF MILPITAS, a municipal corporation in the County of Santa Clara, State of California, hereinafter called "City," and \_\_\_\_\_, \_\_\_\_\_, California \_\_\_\_\_, hereinafter called "Contractor," hereby agrees:

1. That into this contract, as though fully set out herein, are incorporated the Notice Inviting Bids, Instructions to Bidders, Bid Submitted by Contractor, General Conditions, Special Provisions, Technical Provisions, Drawings, Addenda, if any, the Plans and Specifications and Drawings heretofore filed with the Purchasing Agent and such other writing as are incorporated in the foregoing, all as set forth in that document entitled Furnish Stormwater Pumping Units at Berryessa Pump Station Bid No. \_\_\_\_ dated \_\_\_\_.

Particular recognition is hereby given to those portions of the contract as above expanded relating to wage rates, 8-hour limits and employment of alien labor, as more specifically set forth in the Government Code of the State of California.

2. That the Contractor shall perform and be bound by all of the terms and conditions of this contract as above expanded and in strict conformity therewith shall perform and complete in a good and workmanlike manner: Furnish Stormwater Pumping Units at Berryessa Pump Station Bid No. \_\_\_\_ in accordance with maps, plans and specifications on file in the office of the Purchasing Agent of the City of Milpitas.
3. That for such performances the City shall pay to the Contractor the prices set forth in the accepted Bid Form shown on pages three and four of the Bid Documents. The Contractor shall receive total compensation in an amount not to exceed \_\_\_\_\_ dollars and \_\_\_\_\_ cents (\$\_\_\_\_\_), upon satisfactory completion of the work. The Contractor shall accept such Labor & Materials in full satisfaction of all claims incident to such performances.
4. That in no case shall any department, board or officer in the City be liable for any portion of the contract price nor shall the City or any department, board or officer thereof be liable for any of the work performed by said Contractor under this contract.
5. That in accordance with the provisions of Section 1296 of the Code of Civil Procedures of the State of California, in any arbitration whether agreed to or required by law to resolve a dispute relating to this contract, the arbitrator's award shall be supported by law and substantial evidence.

IN WITNESS WHEREOF, the parties have executed this contract the day and year first above written.

Approved as to Form:

THE CITY OF MILPITAS

By: \_\_\_\_\_  
City Attorney

By: \_\_\_\_\_  
City Manager

Approved as to Sufficiency

\_\_\_\_\_  
Inc.

By: \_\_\_\_\_  
Project Manager

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Typed name and capacity or title)

Attest:

By: \_\_\_\_\_

## **SECTION B - GENERAL CONDITIONS AND INSTRUCTIONS TO BIDDERS**

No bids shall receive consideration by the City of Milpitas (hereinafter "City") for IFB No. 8135 unless made in accordance with the following instructions:

1. **Deadline for Receipt of Bids**

Bids must be sealed and delivered by mail or in person to the Information Counter located on the first floor of City Hall at 455 E. Calaveras Blvd., Milpitas, California, no later than 2:00 o'clock p.m. May 24,, 2005. All bids must be received prior to that time. Bid results shall constitute public record and shall be available for inspection two working days following the bid opening.

2. **Bidders Conference**

A **Mandatory** bidder's conference/walkthrough will be held on Tuesday, May 17, 2005, at 10:00 a.m. at Berryessa Stormwater Pump Station on Folsom Circle at Hidden Lake Park off Milpitas Boulevard Milpitas, CA. 95035, for the purpose of acquainting all prospective bidders with the bid documents. It is important that all prospective bidders attend this conference. Failure to attend the conference will disqualify a bid from a non-attending bidder. Following this meeting, a mandatory site review will be conducted to acquaint bidders with the project.

3. **Request for Information**

Any questions relative to the bid should be directed to Chris Schroeder, Purchasing Agent at (408) 586-3161 or e-mailed to [cschroeder@ci.milpitas.ca.gov](mailto:cschroeder@ci.milpitas.ca.gov).

4. **Bid Forms**

Bids must be made on a form obtained from the City. All items on the form should be filled out. Numbers should be stated in figures, and signatures of all individuals must be in long hand. The completed form should be without interlineations, alterations or erasures.

5. **Execution of Forms**

Each bid must give the full business address of the bidder and must be signed by the bidder with his or her usual signature. Bids by partnerships must furnish the full names of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters. Bids by corporations must be signed with the legal name of the corporation, followed by the signature and designation of the President, Secretary, or other person authorized to bind the corporation in this matter. The name of each person signing shall also be typed or printed below the signature. When requested by the City, satisfactory evidence of the authority of the Officer signing on behalf of the corporation shall be furnished. A bidder's failure to properly sign required forms may result in rejection of the bid.



6. Bonds

The successful bidder shall be required to submit bid, labor and materials, and performance bonds as specified in the Invitation for Bid. All required bonds shall be calculated on the maximum total purchase price (100%). A bidder's failure to submit the bonds requested may result in the rejection of the bid.

7. Bid Security

Bids shall be accompanied by a certified cashier's check or bidder's bond for an amount not less than ten percent (10%) of the bid amount. The cashier's check or bid bond shall be made payable to the order of the City of Milpitas. The bond shall be secured by a surety company satisfactory to the City. The cashier's check or bond shall be given as a guarantee that the bidder will enter into the contract if awarded the work, and in the case of refusal or failure to enter the contract within thirty (30) calendar days after notification of the award of the contract, the City shall have the right to award to another bidder. If the bidder fails or refuses to timely enter into the contract, the City reserves the right to declare the bid bond forfeited and to pursue all other remedies in law or equity relating to such breach including, but not limited to, seeking recovery of damages for breach of contract. Failure to provide bid security, or bid security in the proper amount, shall result in the rejection of the bid.

8. Labor & Materials Bond

California law requires Labor & Materials bonds for certain public works projects over \$25,000, therefore upon execution of the contract the Successful Bidder for work involving an expenditure of greater than \$25,000 will be required to furnish, within **ten (10) consecutive calendar days** after written notice, a Labor & Materials Bond in an amount equal to one hundred percent (100%) of the total amount of the contract. See below for Substitution for Retained Funds."

9. Substitution of Securities for Retained Funds The contractor shall be permitted to substitute securities for **any** monies withheld by the City to ensure performance under this contract, such substitution to be subject to the limitations and requirements of the California Public Contract Code Part 5, 22300.

10. Withdrawal of Bids

Bids may be withdrawn by the bidder prior to the time fixed for the opening of bids, but may not be withdrawn for a period of ninety (90) days after the opening of bids. A successful bidder shall not be relieved of the bid submitted without the City's consent or bidder's recourse to Public Contract Code sections 5100 et seq.

11. Addenda

Any addenda issued during the time of bidding shall constitute a part of the Contract Documents issued to bidders for the preparation of their bids.

12. Award of Contract

The City shall award the contract to the lowest responsive, responsible bidder who shall give such security as the City may require. The City reserves the right to reject any and all bids, to contract work with whomever and in whatever manner the City decides, to abandon the work entirely and to waive any informality or non-substantive irregularity, as the interest of the City may require.

13. Rejection of Bids

The City reserves the right to accept or reject any and all bids or any portion or combination thereof, or award on the basis of the total bid.

14. Execution of Contract

The successful bidder shall, within Thirty (30) calendar days of receiving notification of award of the contract, sign and deliver to the City the executed contract along with appropriate bonds and insurance, if required. In the event the bidder to whom an award is made fails or refuses to execute the contract within thirty (30) calendar days, the City may declare the bidder's bid deposit or bond forfeited as damages caused by the failure of the bidder to enter into the contract, and may award the work to the next lowest responsive responsible bidder, or may reject all bids and call for new bids.

15. Evidence of Responsibility

Upon request of the City, a bidder shall submit promptly to the City satisfactory evidence showing the bidder's financial resources, the bidder's experience in the type of work required by the City, the bidder's organization available for the performance of the contract and any other required evidence of the bidder's qualification to perform the proposed contract. The City may consider such evidence before making its decision awarding the proposed contract. Failure to submit evidence of a bidder's responsibility to perform the proposed contract may result in rejection of the bid.

16. Special Brand Names

Bidders may request the City to approve any material or product of comparable quality or utility for consideration as an "approved equal" so long as the request is in writing, email is acceptable, and must be received by the Purchasing Agent at least 8 working days prior to the bid opening. Each request must provide the reason for the change and demonstrate the proposed item is equal line item by line item. The City will make every attempt to reply to each request within five (5) working days. The City reserves the right to make all decisions on products and vendor selections. Any cost of testing or evaluation shall be borne by the bidder.

17. Container Costs and Delivery

All costs for containers shall be borne by the bidder. All products shall conform to the provisions set forth in the federal, county, state and city laws for their production, handling, processing and labeling. Packages shall be so constructed to insure safe transportation to point of delivery.

18. Bid Negotiations

A bid response to any specific item of this bid with terms such as "negotiable", "will negotiate", or similar, will result in the bid being considered non-responsive.

19. Indemnity

The bidder must hold harmless and fully indemnify the City, its officers, employees and agents from all damages or claims for damages, costs or expenses that may at any time arise out of the bidder's performance of, or failure to perform acts, required by the contract documents, including, but not limited to, infringement or use of any copyrighted composition, secret process, patented or un-patented invention, article or appliance furnished or used in connection with this bid.

20. Prevailing Law

In the event of any conflict or ambiguity between these instructions and state or federal regulations, the latter shall prevail. Additionally, all equipment to be supplied or services to be performed under the bid shall conform to all applicable requirements of local, state and federal law.

21. Rights and Remedies in the Event of Default

If the bidder defaults in their obligation to enter into a Contract with the City, the City may procure the articles or services from other sources and may recover the loss occasioned thereby from any unpaid balance claimed due by the bidder or by proceeding against a bidder's bonds, if any, or by suit against the bidder. The prices paid by the City shall be considered the prevailing market prices at the time such purchase is made.

22. Governing Law and Venue

In the event of litigation, the bid documents, specifications and related matters shall be governed by and construed in accordance with the law of the State of California. Venue shall be with the appropriate state or federal court located in Santa Clara County.

23. Public Works Claims

Public Works Claims by the Contractor under three hundred seventy-five thousand dollars (\$375,000.00) shall be governed by Public Contracts Code 20104, et seq., incorporated herein by reference, unless the parties have agreed to arbitration pursuant to Public Contracts Code 10240. For claims not subject to arbitration, all claims shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final Labor & Materials. The local agency shall respond in writing within the time specified by law. If the claimant disputes the local agency's written response, claimant may demand a meeting and conference to settle the dispute. Unresolved disputes shall be subject to Public Contracts Code Section 20104.4.

24. Subcontractors

Pursuant to the Subletting and Subcontracting Fair Practices Act, Public Contract Code Section 4100-4114, inclusive, every bid shall, on the enclosed form set forth:

- (a) The name and the location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime contractor's total bid or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 percent of the prime contractor's total bid or Ten Thousand Dollars (\$10,000.00), whichever is greater.
- (b) The portion of the work, which will be done by each subcontractor under this act. The prime contractor shall list only one subcontractor for each portion as is defined by the prime contractor in his or her bid.
- (c) If a prime contractor fails to specify a subcontractor or if a prime contractor specifies more than one subcontractor for the same portion of work to be performed under the contract in excess of one-half of 1 percent of the prime contractor's total bid, the prime contractor agrees that he or she is fully qualified to perform that portion himself or herself, and that the prime contractor shall perform that portion himself or herself.
- (d) No prime contractor whose bid is accepted shall:
  - (1) Substitute any person as subcontractor in place of the subcontractor listed in the original bid, except that the awarding authority, or its duly authorized officer, may, except as otherwise provided in Section 4107.5 of the public contracts code, consent to the substitution of another person as a subcontractor only in situations specified in Public Contracts Code 4107.
  - (2) Permit any subcontract to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the original bid, without the consent of the awarding authority, or its duly authorized officer.
  - (3) Other than in the performance of "change orders" causing changes or deviations from the original contract, sublet or subcontract any portion of the work in excess of one-half of 1 percent of the prime contractor's total bid as to which his or her original bid did not designate a subcontractor.

25. Form of Contract

The bidder selected by the City will be required to execute a contract, a sample of which is included in this bid package. The contract and other documents are subject to the approval of the City and its legal counsel.

26. Licenses

Each bidder and their subcontractors, if any, must possess all appropriate and required licenses or other permits to perform the work as identified in the contract documents. Upon request, each bidder shall furnish the City with evidence demonstrating possession of the required licenses or permits. Failure to submit such evidence to the City's satisfaction may result in the rejection of the bid.

27. Anti-Discrimination

It is the policy of the City that in connection with all work performed under contracts; there will be no discrimination against any prospective or active employee engaged in the work because of race, color, ancestry, national origin, religious creed, sex, age, or marital status. The contractor agrees to comply with applicable Federal and California laws including, but not limited to, the California Fair Employment Practice Act, beginning with Labor Code Section 1735. In addition, the contractor agrees to require like compliance by any subcontractor employed on the work.

28. Wage Scale

Resolution No. 5981 of the City of Milpitas requires that any contractor performing routine and recurring labor or services in excess of \$1,000.00 on behalf of the City of Milpitas, pay not less than general prevailing wage of per diem wages to all employees engaged to perform said labor or services. (This requirement shall not apply to the sale of goods or to professional services, including, but not limited to, consultant services, construction inspection services, engineering services, architectural services, land surveying services, legal services, financial services, accounting or auditing services, data processing services, administrative services, instructional services, personnel services, and services provided by other public entities.)

It shall be mandatory upon the contractor to whom the contract is awarded, and upon any subcontractor thereunder, to not pay less than the said prevailing wage rates to all workers employed in execution of the contract.

29. Transfer of Interest

No interest in the contract shall be transferred to any other party without permission of the City.

30. Bidders Interested in More than One Bid

No person, firm, or corporation shall be allowed to make, or file, or be interested in more than one bid for the same work unless alternate bids are specifically called for. A person, firm or corporation that has submitted a sub proposal to a bidder, or that quoted prices of materials to a bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other bidders or make a prime proposal.

31. Workers' Compensation

In accordance with the provisions of Section 3700 of the Labor Code, contractor shall secure the Labor & Materials of compensation to his employees. Contractor hereby acknowledges the following statement:

"I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

32. Insurance Requirements

Contractor shall take out and maintain and shall require all subcontractors, if any, whether primary or secondary, to take out and maintain:

- a. General Liability insurance for injuries including accidental death to any one person in an amount not less than \$1,000,000.00;
- b. Subject to the same limit for each person on account of one accident, in an amount not less than \$1,000,000.00;
- c. Auto insurance in an amount not less than 1,000,000.00;
- d. Workers' Compensation Insurance in an amount adequate to cover all employees;
- e. Insurance covering special hazards: Where specified, special hazards shall be covered by a rider or riders to above mentioned public liability insurance or property damage insurance policy or policies of insurance, or by special policies of insurance.

33. Proof of Carriage of Insurance

Contractor shall not commence work nor shall contractor allow any subcontractor to commence work under this contract until all required insurance and certificates have been delivered in duplicate to and approved by City:

- a. Certificates of insurance policies shall include the following clause:

"This policy shall not be canceled or reduced in required limits of liability or amounts of insurance until notice has been mailed to City stating date of cancellation or reduction. Date of cancellation or reduction may not be less than ten (10) days after date of mailing notice."
- b. Certificate of Insurance shall state in particular those insured, extent of insurance, location and operation to which insurance applies, expiration date and cancellation and reduction notice.
- c. Contractor shall be solely responsible for:
  - 1) Compliance of subcontractors with insurance requirements; and
  - 2) Other insurance coverage including, but not limited to, loss, theft, fires, property damage, and glass breakage.

34. Employment of Apprentices

Contractor agrees to comply with Labor Code Sections 1773.3, 1775.5 and 1777.6, and 3077 et seq., each of which is incorporated by reference into this contract. These sections require that contractors and subcontractors employ apprentices in apprenticeable occupations in a ratio of not less than one (1) apprentice for each five (5) journeymen, unless an exemption is granted, and that Contractors and subcontractors shall not discriminate among otherwise qualified employees as indentured apprentices on any public works project solely on the ground of race, religious creed, color, national origin, ancestry, sex, or age. Only apprentices who are in training under written apprenticeship agreements will be employed on public works projects.

## SECTION C -SPECIAL CONDITIONS

### C-1 Damage to property

Any property, including but not limited to the existing structures, equipment, piping, pipe covering, etc., damaged by the contractor during the course of his work shall be replaced or repaired by the contractor in a manner satisfactory to the City and at the contractor's expense.

### C-2 Disposal of materials

All packaging materials, scraps, used containers, debris, etc., shall be removed from the job site and disposed of by the contractor, all to the satisfaction of the City. The contractor shall perform the hauling and disposal of materials off the job site and the costs shall be included in the contract.

### C-3 Clean Air Act of 1970 and Federal Water Pollution Control Act.

The contractor shall comply with the provisions of the Clean Air Act, as amended (42 W.S.C. 1957 et. seq.) and the Federal Water Pollution Act, as amended (33 U.S.C. 1251 et. seq.) and the regulations thereunder (40 C.F.R. part 15).

### C-4 Payments

Progress payments will be authorized based on ninety (90%) percent of the value of the work then done. An amount sufficient to bring the total payments to a total of ninety (90%) percent of the contract price will be authorized at the completion of the work. A final payment of ten (10%) percent will be authorized ninety (90) days after the completion and acceptance of the work.

### C-5 Condition of the Work Site

Care shall be taken to provide safety and egress and ingress to the work area. The contractor shall also coordinate with the owner to cover and secure exposed work, as well as cleaning the work area as required, prior to any use of the property by the owners or user groups.

### C-7 Final Guarantee

The contractor shall be held responsible for and make good any defects through faulty, improper or inferior workmanship, arising or discovered in any part of the contractor's work within one (1) year after the completion and acceptance of the work. The bond for faithful performance, furnished by the contractor, shall cover such workmanship or material defects and protect the City against them. Longer guarantee periods shall apply where specifically called for in the detailed specifications.

### C-8 Licensing

Contractor shall have a contractor's license for the work being done. This license shall be current and active at the time of bid opening and must be listed on page three of the Bid Document.



#### C-9 Bid Submittal Items

The contractor shall submit one (1) original and three (3) copies of the following items to be considered a complete package; Bid Form, (pages 3 and 4 of the bid document); Bid Bond in the amount of 10% of the contract price; Labor & Materials Bond in the amount of 100% of the contract price (if applicable); your list of substitutions including explanation as to why it is a better option for the City (remember, the substitution must be pre-approved by the City); List of references; Any information about your company, product, or process that would be of interest to the City.

#### C-10 Contractor Responsibility

Any work completed by the contractor that does not meet the quality standards as determined by the City, shall be re-done by the contractor at no cost to the City. In the event contractor's work repeatedly does not meet the quality standards, the Purchasing Agent, or Project Manager reserves the right to terminate the contract at any time without cost to the City

#### C-11 Liquidated Damages

It is agreed by the parties to the contract that failure to complete the work or any part thereof in the time agreed upon in the contract, or within such extra time as may have been allowed for delays or extensions granted as provided in the contract, will cause damage to the City of Milpitas and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the City will sustain in the event of and by reason of such delay, and it is therefore agreed that the Contractor will pay to the City of Milpitas the sum of \$500 for every day including Saturdays, Sundays and holidays that the contract remains uncompleted after the date required for completion, including all punch list items, and it is agreed that said amounts will be deducted from any money due the Contractor under his or her contract and the Contractor and his or her sureties shall be liable for any excess.

#### C-12 Document Precedence

The plans together with the specifications attached hereto, will govern the work to be done. Anything mentioned in these specifications and not shown on the plans and detail drawings and anything shown on the plans and detailed drawings and not mentioned in these specifications shall be of like effect as though shown or mentioned in both. In case of any conflict, the following shall be the order of precedence.

1. Contract Change Orders
2. Contract
3. Addenda, if any
4. Technical Specifications
5. Special Conditions
6. General Conditions
7. Plans
8. City Standard Specifications
9. City Standard Drawings
10. Specified sections and details of the Caltrans Standard Specifications and Standard Plans, dated July 2002, and any addendums thereof. Sections 1-9 of the Caltrans Standard Specifications are excluded and are not part of or included in these Contract Documents.

Copies of the most current City Standard Drawings and Specifications may be obtained upon request at the office of the City Engineer.

The Engineer may furnish from time to time such detail drawings, plans, profiles and information as he may consider necessary for the Contractor's guidance, unless otherwise provided in the proposal, agreement or detail specifications. In cases where the contract work or any portion thereof is to be performed in accordance with drawings, specifications, lists of data submitted by the Contractor and approved by the Engineer, such approved drawings, etc., shall become portions of the Plans and Specifications as regards the specific matters to which such approval applies. The Contractor shall be solely responsible for the correctness of the measurements and other essential information submitted by him and for the correlation of the various portions and features of the work, which are or may be affected by such measurements and information.

Any change required by the Engineer in the drawings, etc., submitted for approval by the Contractor, shall be considered as necessary in order to comply with the requirements of the plans and specifications, and shall not be the basis of any claim for extra compensation over and above the bid price for the work, except where changes involving the extra work are expressly authorized and ordered in accordance with the section of these specifications relating to changes and extra work.

A copy of the plans and specifications shall be kept upon the work at all times during its progress, and access thereto shall at all times be accorded the Engineer. At the end of the construction, the Contractor shall provide the Engineer with a complete red-lined copy of "As-built" drawing showing all the changes from the original plan.

The Contractor shall, for the price bid, furnish all supervision, labor, materials, transportation and equipment necessary to execute the work in every respect in a thorough, workmanlike manner in accordance with the plans, profiles and specifications, and to the satisfaction of the Engineer. All work shall, during its progress and until its completion, conform to the lines, elevations and grades shown on said plans and profiles.

**SECTION D - NOT USED**

## **SECTION E – TECHNICAL PROVISIONS**

**Sections E-1 through E-25: Not Used**

## E-26 MAIN PUMPING UNITS

### A. General

### B. Equipment

1. Pumps
  - 1a. Pump Type
  - 1b. Pump Design Requirements
  - 1c. Pump Performance Requirements
  - 1d. Pump Construction
2. Diesel Engine Pump Drives
  - 2a. Engine Type
  - 2b. Engine Manufacturer and Model
  - 2c. Engine Appurtenances
  - 2d. Power Transmission
  - 2e. Engine Electrical System
  - 2f. Engine Fuel System
  - 2g. Diesel Engine Spare Parts
3. Right Angle Drives
  - 3a. Right Angle Drive Type
  - 3b. Right Angle Drive Casing
  - 3c. Right Angle Drive Gears
  - 3d. Right Angle Drive Bearings
  - 3e. Right Angle Drive Shafts
  - 3f. Right Angle Drive Lubrication

### C. Quality Assurance

1. Factory Tests
  - 1a. Engine Tests
  - 1b. Pump Tests
2. Submittals
3. Startup Services
4. Acceptance Tests
5. Training and O&M Manuals
6. Warranty
7. Equipment Name Plates

### D. Delivery, Storage, and Handling

### E. Payment

## A. General

Bidder shall furnish, supervise installation, ensure that installation is in compliance with the manufacturer's recommendations, and test three vertical pumping units, right-angle gears, and diesel engine drives as specified herein, to replace the existing pumping units. Installation of equipment provided by Bidder shall be performed by a separate Contractor retained by the City to perform general pump station improvements (Contractor). Bidder shall coordinate pumping equipment delivery with the City's representative responsible for this project, and make sure it is properly installed by the Contractor. Bidder shall be responsible for factory tests, startup services, acceptance tests, training, and equipment operation and maintenance manuals. Bidders shall have a minimum 10 years experience with providing, coordinating installation and providing startup services of units of similar size and complexity as those specific herein.

Bidder shall be responsible for selecting and furnishing all the components of the pumps, drives, engines/motor, and transmission systems as integrated, compatible, and fully functional packages that meet the materials, workmanship, and performance requirements of this Specification.

## B. Equipment

### 1. Pumps

**1a. Pump Type:** The pumps shall be vertical mixed or axial flow units suitable for operation with variable speed drive equipment, as manufactured by Cascade Pump Company, Santa Fe Springs, California; Fairbanks Morse, Kansas City, Kansas; Goulds Pumps, ITT Industries, Seneca Falls, New York; or other well established pump manufacturer with at least 10 years of experience furnishing pumping units and acceptable to the City.

**1b. Pump Design Requirements:** The pumps shall be suspended from mounting baseplates 3.5 feet above the finished floor elevation of 10.5 feet (NGVD29), as illustrated in Figures 1 and 2. The pumps shall be capable of dewatering the wet well to a water depth of 12 feet to the wet well floor. The centerline of the horizontal discharge pipes shall be below the mounting baseplates at elevation 8.75 feet. The discharge connections shall be 30-inch diameter plain end suitable for attachment to existing Dresser couplings. The suction inlets shall be flared to resist the formation of damaging vortices. The complete unit when operating within the specified head range shall be free of excessive vibration, cavitation, and noise. The design of component parts shall be flanged on each end with a register machined on centers to assure positive alignment when connected to mating parts. Design shall be such that no damage will occur in the event of reverse rotation caused by backflow of water through the pump.

**1c. Pump Performance Requirements:** The pump shall be designed to run at maximum efficiency at a flow rate of 20,000 gallons per minute (GPM) against a total head of 23.4 feet. The total head includes the vertical difference in feet between the normal operating water level in the wet well and the highest water elevation in the discharge system, as well as friction losses in the piping system for the rated capacity. It shall be the pump manufacturer's responsibility to compute and add the internal pump losses to the total head to determine the total dynamic

bowl head of the pump. The minimum hydraulic efficiency at best efficiency point shall be no less than 72 percent.

#### **1d. Pump Construction:**

**Bowl Assembly** - The suction and discharge bowls shall be of cast iron with a minimum tensile strength of 30,000 psi. The impeller shall be cast bronze and locked to the bowl shaft by a key and thrust collar. The bowl shaft shall be made from type 416 stainless steel and polished at each bearing journal. The size of the shaft shall be sufficient to safely transmit the required brake horsepower to the impeller for producing the specified performance. Bronze bushings shall be provided immediately above and below the impeller/propeller.

**Discharge Elbow and Column** - The elbow and column shall be of fabricated mild steel with a minimum thickness of 1/4". The elbow shall be of the right angle vanned type. The lower section may be tapered for connection to the discharge bowl.

**The Lineshaft** shall be made from carbon steel and supported by bearings. The lineshaft bearings shall be threaded externally to act as a coupling for extra heavy steel enclosing tubes. The lineshaft bearings shall be bronze of the removable type and must be provided with a means of passing oil from one bearing to the next. A means shall be provided for tension loading of the enclosing tube.

**Lubrication** - The lineshaft bearings shall be lubricated by a drip-feed oil system utilizing an oil reservoir, solenoid valve, and needle valve dripper. The suction bowl bushing shall be grease packed.

## **2. Diesel Engine Pump Drives**

**2a. Engine Type:** Engines shall be water-cooled inline, four-cycle compression ignition diesel capable of variable speed operation, arranged for connection to vertical pumps through right angle gear drives. Engines shall meet specifications when operating on number 2 diesel fuel. Engines shall operate at full load output without undue heating, vibration, noise or wear. Engine exhaust shall meet emission standards stipulated by the Airborne Toxic Control Measure for Stationary Compression Ignition Engines and the Bay Area Air Quality Management District to include but not limited to less than 0.15 g/bhp-hr of particulate matter without the addition of special filters or catalytic converters.

**2b. Engine Manufacturer and Model:** The diesel engine pump drives shall be Caterpillar Model 3126B, with a "C" rating for intermittent operation (the three engines combined will typically operate from 200 to 300 hours per year). Engines shall be sized to provide adequate power capacity (brake horsepower) to their pumps at the rated operating conditions, but shall be no less than 185 horsepower (Model 3126B meets air quality emission requirements in California only for units 185 horsepower or larger). Operation is anticipated to be sporadic during rainy seasons and minimal during dry seasons.

**2c. Engine Appurtenances:** Engines shall be furnished with standard manufacturer's equipment to include air inlet, charging, control, cooling, exhaust, muffler, and fuel systems; flywheels and flywheel housings; flexible connections and heat shields; instrument panel with

engine oil pressure, fuel pressure, ammeter, and water temperature gages, tachometer, and electric hour meter; lube system; front and rear supports for pad mounting; starting and protection systems; and vibration damper, lifting eyes, and belt guard. A jacket water heater shall be provided for system water to facilitate quick startup. Exterior surfaces of engine shall be painted with two coats of oil- and heat-resistant paint applied after surfaces have been thoroughly cleaned and prepared with suitable priming coat.

**2d. Power Transmission:** Engines shall be provided with suitable transmissions for connection to right-angle drives. Transmissions shall be made by Twin Disc, Inc. or other approved manufacturer. A flexible coupling of centrifugal type shall be provided between the transmission and the right angle drive, with a lever-operated clutch for manual operation. The coupling shall permit the engine to operate at idling speed of not more than 1000 rpm without turning pump. The coupling shall automatically pick up load when engine speed increases above 1000 rpm and shall automatically release load when the speed drops below 1000 rpm. The coupling shall transmit the maximum horsepower developed by the engine without slip or overheating at speeds over 1200 rpm. A safety cage shall be provided around the drive shaft.

**2e. Engine Electrical System:** The electrical system for each engine shall include batteries (nickel cadmium cells), starting motor, voltage and current-regulated charging generator or alternator, and a separate battery charger. Batteries shall be of suitable capacity to crank engine for 1-1/2 minutes without recharging and shall be guaranteed for at least three years.

Battery chargers shall be automatic, two rate type providing for equalizing charge and continuous taper charging. Output characteristics shall match requirements of batteries furnished. Chargers shall be suitable for operation on 120 volt, single-phase, 60-Hertz current to be rated not less than 10-amp direct current. Each battery charger shall be furnished with: direct current voltage regulation (plus or minus two percent for variations in line voltage of plus or minus ten percent); direct current voltmeter and direct current ammeter, each with suitable scales; automatic charge suppressor; automatic current limiting to prevent overloading due to engine cranking, shorted output, or reversed battery connections; alternating current line fusing; integral protection to prevent battery discharge through charger on loss of alternating current line voltage; terminal block with terminals for all external connections.

Battery racks shall be provided to accommodate starting batteries. Racks shall be approved for installation in Seismic Zone 4. An appropriate supporting rack or frame shall be provided for battery chargers, which shall be wall-mounted. Racks shall be installed within building in close proximity to the engine they serve. Where wall mounting is needed, enclosures shall be suitable for conduit connection and ventilating openings shall be guarded.

**2f. Engine Fuel System:** There is an underground fuel storage tank as well as a 50-gallon day tank on site. Bidder is responsible for ensuring that proper connections and fittings are supplied for interfacing the fuel oil piping and providing the proper connections. The existing fuel distribution device on site is a Model SST 25 manufactured by Simplx, Inc., with a 1/3 hp motor.

The diesel engine fuel system shall be of the direct injection type. The fuel charge injected to each cylinder shall be by variable displacement injection pump; a system relying on pressure and time will not be acceptable. A fuel injection system requiring routine adjustments is not



acceptable. The diesel fuel system for each engine shall consist of an engine-driven fuel supply pump and fuel filter.

The engine-driven fuel supply pump on each engine shall operate to supply fuel to each engine from the day tank. Bidder is to assure that the system supplied will operate to return excess fuel oil from the engines to the day tank.

Fuel filters shall have elements that may be easily replaced without breaking any fuel line connection or disturbing fuel pumps or other parts of the engine. Filters shall be conveniently located ahead of injection or circulating pumps so that fuel is thoroughly filtered before it reaches injectors.

**2g. Diesel Engine Spare Parts:** Provide spare parts as recommended by manufacturer for one year of operation for each engine, plus the following for each engine (if not already included):

- Four filters for all services;
- Six spare injectors;
- One fuel injection pump;
- One box of fuses.

Pack spare parts individually in suitable containers or boxes bearing labels that clearly designate contents and piece of equipment for which they are intended. Deliver spare parts at the same time as equipment to which they pertain. Properly store and safeguard spare parts until acceptance testing for pumping units, at which time they shall be submitted to a City representative.

### 3. RIGHT ANGLE DRIVES

**3a. Right Angle Drive Type:** The gear reducers shall be single reduction spiral/bevel gears, right angle drives, with horizontal input shafts, and vertical downward output shafts, as manufactured by De'Ran Gear, Inc., Lubbock, Texas, or Johnson Gear, Inc., also of Lubbock, Texas. The gear reducer output shaft shall be coupled to the vertical shafting, and shall support the full weight of the vertical shafting. Gear reducer efficiency shall be not less than 97%. The gear ratio shall be set based on the speed of the diesel engine drivers and the required speed of the pumps.

The gear reducer should have a sprag type non-reverse mounted on the horizontal input shaft to stop the pump from reverse rotation.

**3b. Right Angle Drive Casing:** The casing shall be high tensile strength (minimum 30,000 PSI) cast iron or fabricated steel of adequate strength and rigidity to withstand all loads imposed on it from operation of the equipment, to maintain all gears, bearings, and seals in precise alignment. Lifting lugs shall be provided on the housing suitably located to enable safe removal of the gear reducer. The housing shall be equipped with tapping for oil fill, drain, level indication, breather, etc. and inspection covers as required, which shall be arranged and located for easy observation and access.

**3c. Right Angle Drive Gears:** Gears shall be precision cut from alloy steel. All gears shall be manufactured spiral bevel. Gear teeth shall be carburized and hardened to 58 to 60 Rockwell C and lapped. Final surface finish of the gear teeth shall be 32 micro-inch or better. Calculations for strength and durability of gearing shall be based upon industry standards. Ratings shall allow for a minimum of 200 percent momentary starting torque, and shall have a minimum of 1.5 service factor above the nameplate horsepower.

**3d. Right Angle Drive Bearings:** All bearings incorporated within the gear reducer shall be of the anti-friction type with an Anti-Friction Bearing Manufacturer's Association minimum rated life expectancy (B-10) of 25,000 hours when operating continuously at the full rated gear reducer output brake horsepower. All bearings shall be of standard design, readily available. Bearings shall be oversized to assure the exact position of gears and shafts are maintained. The output shaft bearings shall be oversized steep angled tapered roller bearings, designed to support the weight, and all operating loads of the vertical shafting to be connected to the pump.

**3e. Right Angle Drive Shafts:** All shafts shall be of SAE 4130 steel, designed to appropriate limits for shaft stress and to minimize deflection, with close finished tolerances by grinding and polishing.

**3f. Right Angle Drive Lubrication:** Lubrication shall be by oil pressure lubrication of gears and bearings. All shafts shall have double lip oil seals, and the housing construction at the output shaft shall be dry well type to prevent oil from leaking down the output shaft. A positive displacement oil pump shall be provided integral to the gear reducer housing to provide oil circulation, and shall be driven from the gear reducer output shaft. The oil shall be circulated by the internal gear pump through a vertically mounted heat exchanger designed to dissipate heat from the reducer. The heat exchanger shall be designed to dissipate heat during full load pump operation in a 40° C ambient temperature. The heat exchanger shall be equipped with a fan which turns constantly with the vertical shaft.

## **C. Quality Assurance**

### **1. Factory Tests**

**1a. Engine Tests:** Each engine shall be given standard commercial tests in the shop of the engine manufacturer, and certified copies of the test results for each engine shall be submitted to City Engineer for review prior to the shipping of engines from shop.

In addition to standard commercial tests, one engine shall be subjected to complete tests witnessed by a City Engineer. Bidder shall provide a minimum 10 days notice to City Engineer for witness testing.

**1b. Pump Tests:** Pump manufacturer shall test each pump to ensure that it operates satisfactorily and meets specified requirements. Shop tests on one typical pump shall be

witnessed by a City Engineer. Bidder shall provide a minimum 10 days notice to City Engineer for witness testing.

Factory tests shall include tests at variable speeds. During each test, pump shall be run for sufficient time to permit accurate determination of discharge, head, and power input. Certified copies of test data showing resulting head-discharge curves throughout speed range and corresponding brake horsepower and pump efficiency shall be submitted to City Engineer for review. Tests shall be performed in accordance with Hydraulic Institute Standards.

## **2. Submittals**

Bidder shall submit certified shop and working drawings, and data regarding pump and driver characteristics and performance. Data shall include guaranteed performance curves based on shop tests of pumping units that show units meet specified requirements for head, capacity, and efficiency at rated conditions. Curves shall be submitted on 8-1/2 by 11 inch sheets. Shop drawings for accessory equipment shall also be submitted.

## **3. Startup Services**

An authorized Bidder's representative shall inspect the installation of all equipment furnished under this section and shall provide a certificate of satisfactory installation. The representative shall verify that electrical panels, instrumentation, alarms, and controls (installed by others) are appropriately installed.

Bidder shall furnish the services of a qualified factory-trained field inspector for two 8-hour working days at the job site to startup the pumping units and certify their functionality. The inspector shall perform a torsional analysis on the entire system to make sure torsional vibrations due to resonance do not occur at operating speeds. If the inspector is not qualified to perform the torsional analysis, Bidder shall retain an independent contractor to perform the analysis.

## **4. Acceptance Tests**

Each of the three pumping systems shall be tested individually after Bidder has certified their correct installation and functionality. Bidder shall submit performance curves to City Engineer prior to the Acceptance Tests, together with a write-up on test methods and procedures. Representatives of the pump and engine manufacturers shall conduct the entire Acceptance Testing process. Tests shall conform to the most recent version of the Hydraulic Institute Test Standards.

Acceptance Tests should demonstrate the ability of each pumping system to operate without excessive vibration, noise, or overheating, and to deliver its rated capacity under specified conditions. Tests shall include observations of general performance and measurement of head, discharge, and power input. All defects or defective equipment revealed by or noted during these tests shall be corrected or replaced promptly at the expense of Bidder. If necessary, tests shall be repeated until results acceptable to the City Engineer are obtained. Bidder shall furnish

all labor, material, and equipment necessary to perform these tests. Water for testing shall be furnished by the City.

In the event that Bidder is unable to demonstrate to satisfaction of City Engineer that pumping units will satisfactorily perform service required and that they will operate without excessive vibration and heating, pumping units may be rejected. Bidder shall then remove and replace equipment at Bidder's own expense and will be liable for any liquidated damages incurred by the contractor responsible for general pump station improvements

Bidder shall coordinate all Acceptance Tests with the City's representative responsible for this project.

## **5. Training and O&M Manuals**

An authorized Bidder's representative shall provide one 8-hour day of training to City personnel. The training shall include pump startup and shutoff procedures, routine maintenance, and pump and driver trouble shooting.

Bidder shall provide the City two paper copies of Operation and Maintenance manuals for all equipment installed. Electronic copies shall also be provided in PDF format on a compact disc.

## **6. Warranty**

Upon the City's approval of the installed equipment, Bidder shall furnish a five (5) year material and workmanship warranty for all equipment furnished under this Section.

Bidder shall have a factory-authorized service agency staffed by factory-trained technicians within a 100-mile radius of the project site. Bidder must be able to respond to any emergency warranty-related service calls within 24 hours, and to service calls of a non-emergency nature within 72 hours. If Bidder should fail to honor the time requirement specified above, the City will use alternate repair sources and charge Bidder for such repairs.

## **7. Equipment Name Plates**

Metal name plates giving the name of the manufacturer, the serial number of the item, the rated capacity, speed and other pertinent data, shall be attached to each piece of equipment, in a clearly visible location with information stamped into the plate.

## **D. Delivery, Storage, and Handling**

Bidder shall ship equipment, materials, and spare parts complete except where partial disassembly is required by transportation regulations or for the protection of components. Spare parts shall be packed in containers bearing labels clearly designating contents and equipment for which they are intended.

Bidder shall coordinate delivery of equipment, materials, and spare parts to project site or to a temporary storage site with City's representative and pump station improvements Contractor. Time is

of the essence. It is anticipated that the time between delivery of components (requested for no later than September 5, 2005) and the onset of the rainy season will be less than six weeks. The new pumping units must be operational and have satisfactorily undergone acceptance testing by October 14, 2005, unless otherwise directed by the City Engineer.

Bidder shall assume responsibility for equipment, material, and spare parts until they are unloaded from carrier at the job site or at the temporary storage site. City Engineer, pump station improvements Contractor, and Bidder shall jointly inspect and inventory items upon delivery. The pump station improvements Contractor shall assume responsibility for the storage and handling of delivered components after inspection and inventory.

#### **E. Payment**

The contract lump sum price paid for "Main Pumping Units" shall include full compensation for furnishing all equipment, accessories, and incidentals, and for providing submittals, certifications, coordination, installation supervision, startup services, acceptance testing, training, and O&M Manuals. Bidder shall be paid ten percent of the lump sum price after approval of shop drawings, forty percent of the lump sum price after successful completion of the factory testing, twenty percent of the lump sum price after delivery of equipment, twenty percent of the lump sum price after a qualified factory-trained field inspector certifies their functionality. The remaining ten percent of the lump sum price shall be paid after satisfactory completion of Acceptance Tests, or ninety days after certification of functionality, whichever occurs first. Ten percent retention will be held on all payments and released after initial acceptance of the project by the City Council.

**End Section**

## **E-27 JOCKEY PUMP**

### **A. General**

### **B. Equipment**

1. Pump
  - 1a. Pump Type
  - 1b. Pump Design Requirements
  - 1c. Pump Performance Requirements
  - 1d. Pump Construction
2. Electric Motor Pump Drive

### **C. Quality Assurance**

1. Factory Tests
  - 1a. Motor Tests
  - 1b. Pump Tests
2. Submittals
3. Startup Services
4. Acceptance Tests
5. Training and O&M Manuals
6. Warranty
7. Equipment Name Plates

### **D. Delivery, Storage, and Handling**

### **E. Payment**

### **A. General**

Bidder shall furnish, supervise installation, ensure that installation is in compliance with the manufacturer's recommendations, and test one vertical pumping unit driven by an electric motor controlled by a variable frequency drive, as specified herein, to replace the existing jockey pump at the Berryessa Pump Station. Installation of equipment provided by Bidder shall be performed by a separate contractor retained by the City to perform general pump station improvements (Contractor). Bidder shall coordinate pumping equipment delivery with the City's representative responsible for this project and make sure it is properly installed by the Contractor. Bidder shall be responsible for factory tests, startup services, acceptance tests, training, and equipment operation and maintenance manuals. Bidders shall have at least 10 years experience with providing, coordinating installation and providing startup services of units of similar size and complexity as those specified herein.

### **B. Equipment**

## 1. Pump

**1a. Pump Type:** The pump shall be a vertical mixed or axial flow unit suitable for operation with variable speed drive equipment, as manufactured by Cascade Pump Company, Santa Fe Springs, California; Fairbanks Morse, Kansas City, Kansas; Goulds Pumps, Seneca Falls, New York; Layne/VertiLine, Inc., Kansas City, Kansas; or other well established pump manufacturer with at least 10 years of experience furnishing pumping units and acceptable to the City.

**1b. Pump Design Requirements:** The jockey pump shall be suspended from a mounting baseplate 3.5 feet above the finished floor elevation of 10.5 feet (NGVD29), as illustrated in Figures 1 and 2. The pump shall be capable of dewatering the wet well to its floor elevation of - 6.83 feet (NGVD29). The centerline of the horizontal discharge pipe shall be below the mounting baseplate at elevation 8.0 feet. The discharge connection shall be 12-inch diameter plain end suitable for attachment to new Dresser coupling. The suction inlet shall be flared to resist the formation of damaging vortices. The complete unit when operating within the specified head range shall be free of excessive vibration, cavitation, and noise. The design of component parts shall be flanged on each end with a register machined on centers to assure positive alignment when connected to mating parts. Design shall be such that no damage will occur in the event of reverse rotation caused by backflow of water through the pump.

**1c. Pump Performance Requirements:** The pump shall be designed to run at maximum efficiency at a flow rate of 5,000 gallons per minute (GPM) against a total head of 38.4 feet. The total head includes the vertical difference in feet between the normal operating water level in the wet well and the highest water elevation in the discharge system, as well as friction losses in the piping system for the rated capacity. It shall be the pump manufacturer's responsibility to compute and add the internal pump losses to the total head to determine the total dynamic bowl head of the pump. The minimum hydraulic efficiency at best efficiency point shall be no less than 72 percent.

### **1d. Pump Construction:**

**Bowl Assembly** - The suction and discharge bowls shall be of cast iron with a minimum tensile strength of 30,000 psi. The impeller shall be cast bronze and locked to the bowl shaft by a key and thrust collar. The bowl shaft shall be made from type 416 stainless steel and polished at each bearing journal. The size of the shaft shall be sufficient to safely transmit the required brake horsepower to the impeller for producing the specified performance. Bronze bushings shall be provided immediately above and below the impeller/propeller.

**Discharge Elbow and Column** - The elbow and column shall be of fabricated mild steel with a minimum thickness of  $\frac{1}{4}$  inch. The elbow shall be of the right angle vaned type. The lower section may be tapered for connection to the discharge bowl.

**The Lineshaft** shall be made from carbon steel and supported by bearings. The lineshaft bearings shall be threaded externally to act as a coupling for extra heavy steel enclosing tubes. The lineshaft bearings shall be bronze of the removable type and must be provided with a means of passing oil from one bearing to the next. A means shall be provided for tension loading of the enclosing tube.

**Lubrication** - The lineshaft bearings shall be lubricated by a drip-feed oil system utilizing an oil reservoir, solenoid valve, and needle valve dripper. The suction bowl bushing shall be grease packed.

## **2. Electric Motor Pump Drive**

The motor for driving the jockey pump shall be Class F insulated, vertical, squirrel-cage induction, TEFC enclosure, continuous duty, solid shaft, with 1.15 service factor. The motor shall conform to latest NEMA Standards. The motor shall be controlled by a variable frequency drive.

Motor shall be sized adequately to develop sufficient torque to start pump and bring it up to full speed, and to operate pump at any point on its characteristic curve without entering into service factor rating. The motor shall be 230/460 volts, 3 phase, 60 Hertz, and shall be suitable for reduced voltage starting. Maximum amperage at starting can be up to 200 amps.

## **C. Quality Assurance**

### **1. Factory Tests**

**1a. Motor Tests:** Motor shall be tested at motor manufacturer's shop.

**1b. Pump Tests:** Pump manufacturer shall test jockey pump to ensure that it operates satisfactorily and meets specified requirements. Shop tests shall be witnessed by a City Engineer. Bidder shall provide a minimum 10 days notice to City Engineer for witness testing.

Factory tests shall include tests at variable speeds. During each test, pump shall be run for sufficient time to permit accurate determination of discharge, head, and power input. Certified copies of test data showing resulting head-discharge curves throughout speed range and corresponding brake horsepower and pump efficiency shall be submitted to City Engineer for review. Tests shall be performed in accordance with Hydraulic Institute Standards.

### **2. Submittals**

Bidder shall submit certified shop and working drawings, and data regarding pump and motor characteristics and performance. Data shall include guaranteed performance curves based on shop tests of pumping unit that show unit meets specified requirements for head, capacity, and efficiency for rated conditions. Curves shall be submitted on 8-1/2 by 11 inch sheets. Shop drawings for accessory equipment shall also be submitted.

### **3. Startup Services**

An authorized Bidder's representative shall inspect the installation of all equipment furnished under this section and shall provide a certificate of satisfactory installation. The representative



shall verify that electrical panels, instrumentation, alarms, and controls (installed by others) are appropriately installed.

Bidder shall furnish the services of a qualified factory-trained field inspector for one 8-hour working day at the job site to startup the pumping unit and certify its functionality.

#### **4. Acceptance Tests**

The jockey pump and motor assembly shall be tested after Bidder has certified its correct installation and functionality. Bidder shall submit performance curves to City Engineer prior to the Acceptance Tests, together with a write-up on test methods and procedures. A representative of the pump manufacturer shall conduct the entire Acceptance Testing process. Tests shall conform to the most recent version of the Hydraulic Institute Test Standards.

Acceptance Tests should demonstrate the ability of the pumping unit to operate without excessive vibration, noise, or overheating, and to deliver its rated capacity under specified conditions. Tests shall include observations of general performance and measurement of head, discharge, and power input. All defects or defective equipment revealed by or noted during these tests shall be corrected or replaced promptly at the expense of Bidder. If necessary, tests shall be repeated until results acceptable to the City Engineer are obtained. Bidder shall furnish all labor, material, and equipment necessary to perform these tests. Water for testing shall be furnished by the City.

In the event that Bidder is unable to demonstrate to satisfaction of City Engineer that the pumping unit will satisfactorily perform service required and that it will operate without excessive vibration and heating, the pumping unit may be rejected. Bidder shall then remove and replace equipment at Bidder's own expense and will be liable for any related liquidated damages incurred by the Contractor responsible for general pump station improvements.

Bidder shall coordinate all Acceptance Tests with the City's representative responsible for this project.

#### **5. Training and O&M Manuals**

An authorized Bidder's representative shall provide one 8-hour day of training to City personnel. The training shall include pump startup and shutoff procedures, routine maintenance, and pump and motor troubleshooting.

Bidder shall provide the City two paper copies of Operation and Maintenance Manuals for all equipment installed. Electronic copies shall also be provided in PDF format on a compact disc.

#### **6. Warranty**

Upon the City's approval of the installed equipment, Bidder shall furnish a five (5) year materials and workmanship warranty for all equipment furnished under this Section.

Bidder shall have a factory-authorized service agency staffed by factory-trained technicians within a 100-mile radius of the project site. Bidder must be able to respond to any emergency warranty-related service calls within 24 hours, and to service calls of a non-emergency nature within 72 hours. If Bidder should fail to honor the time requirement specified above, the City will use alternate repair sources and charge Bidder for such repairs.

## **7. Equipment Name Plates**

Metal nameplates giving the name of the manufacturer, the serial number of the item, the rated capacity, speed and other pertinent data, shall be attached to each piece of equipment, in a clearly visible location with information stamped into the plate.

## **D. Delivery, Storage, and Handling**

Bidder shall ship equipment, materials, and spare parts complete except where partial disassembly is required by transportation regulations or for the protection of components. Spare parts shall be packed in containers bearing labels clearly designating contents and equipment for which they are intended.

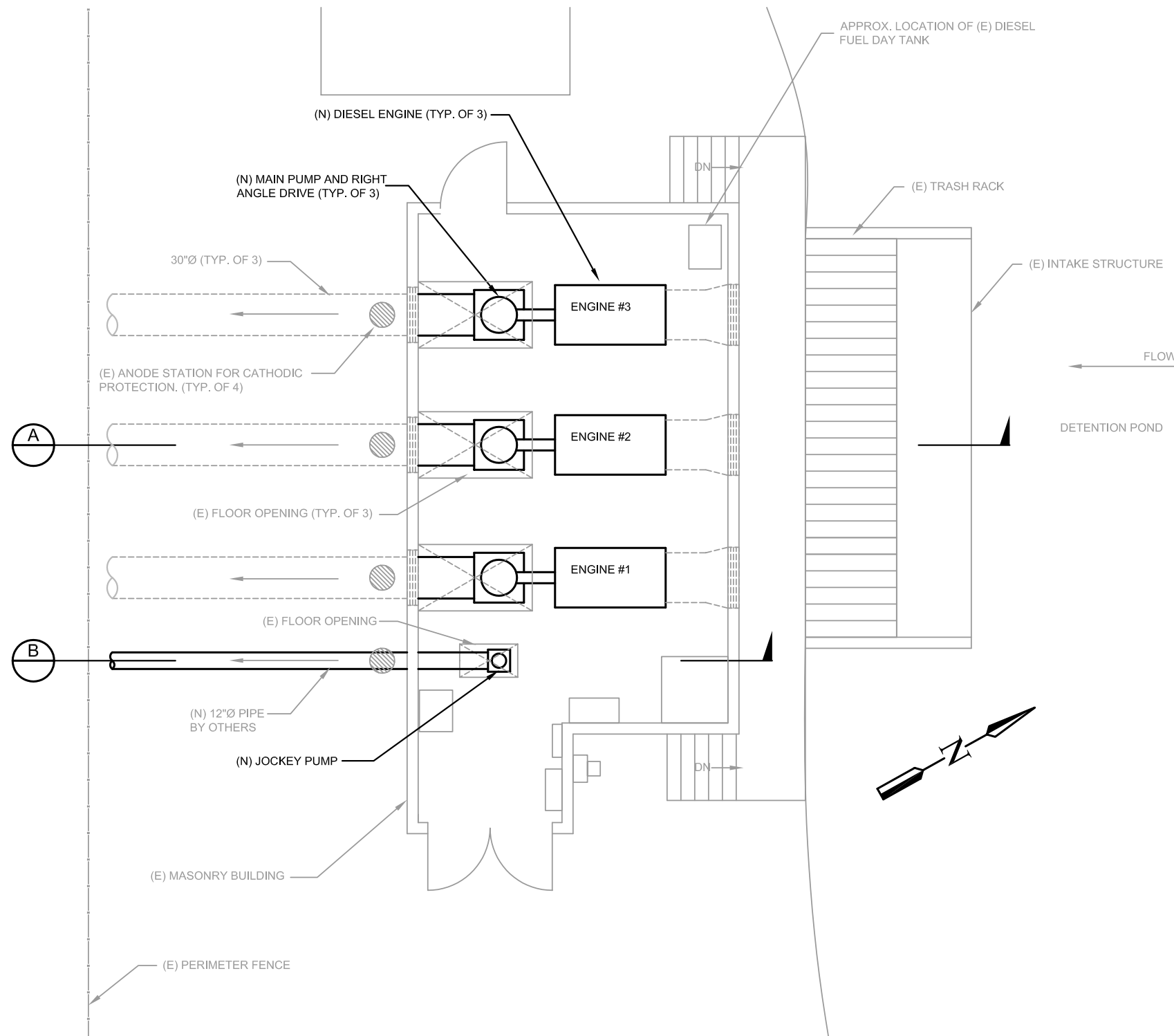
Bidder shall coordinate delivery of equipment, materials, and spare parts to project site or to a temporary storage site with City's representative and pump station improvements Contractor. Time is of the essence. It is anticipated that the time between delivery of components (requested for no later than September 5, 2005) and the onset of the rainy season will be less than six weeks. The new pumping unit must be operational and have satisfactorily undergone acceptance testing by October 14, 2005 unless otherwise directed by the City Engineer.

Bidder shall assume responsibility for equipment, material, and spare parts until they are unloaded from carrier at the job site or at the temporary storage site. City Engineer, pump station improvements Contractor, and Bidder shall jointly inspect and inventory items upon delivery. The pump station improvements Contractor shall assume responsibility for the storage and handling of delivered components after inspection and inventory.

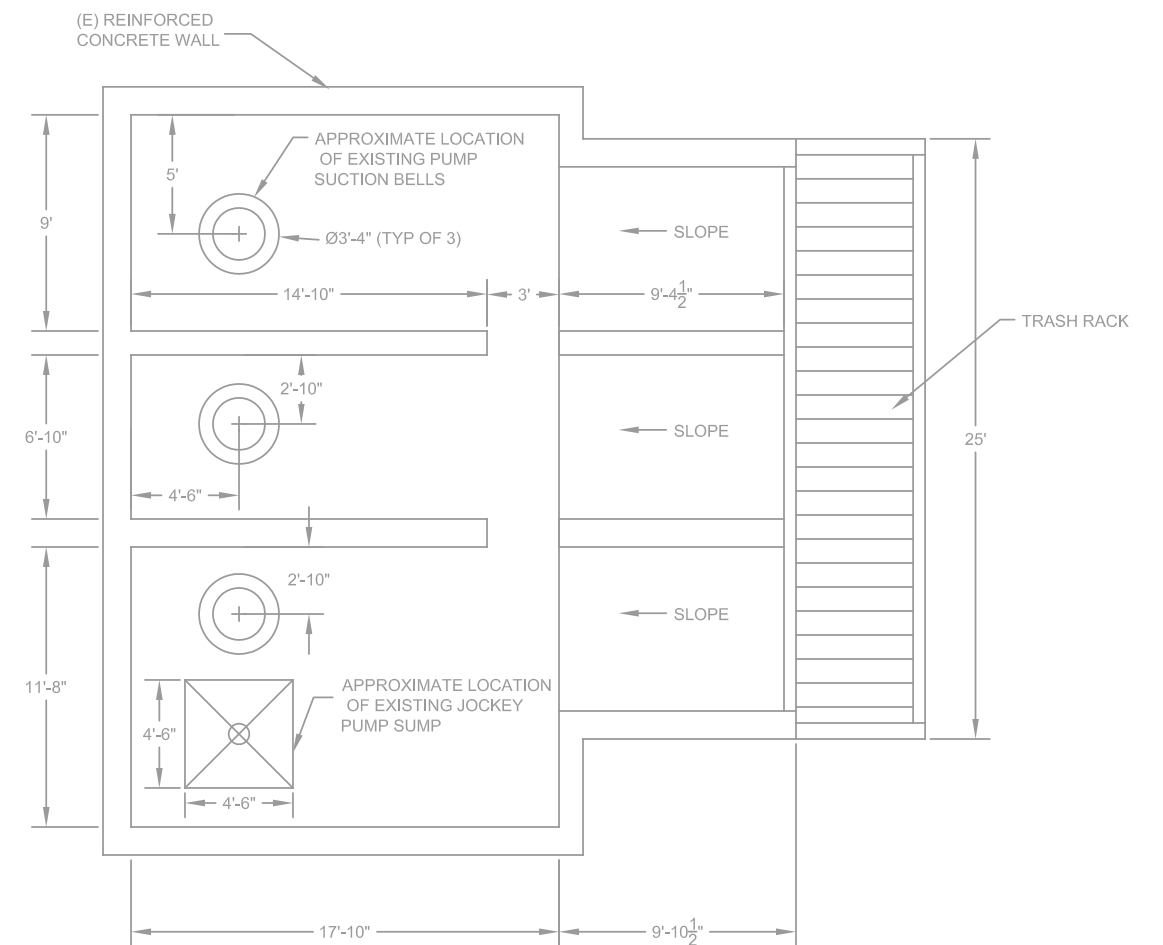
## **E. Payment**

The contract lump sum price paid for "Jockey Pump" shall include full compensation for furnishing all equipment, accessories, and incidentals, and for providing submittals, certifications, coordination, installation supervision, startup services, acceptance testing, training, and O&M Manuals. Bidder shall be paid ten percent of the lump sum price after approval of shop drawings, forty percent of the lump sum price after successful completion of factory testing, twenty percent of the lump sum price after delivery of equipment, and twenty percent of the lump sum price after a qualified factory-trained field inspector certifies their functionality. The remaining ten percent of the lump sum price shall be paid after satisfactory completion of Acceptance Tests, or ninety days after certification of functionality, whichever occurs first. A ten percent retention will be held on all payments and released after initial acceptance of the project by the City Council.

**End Section**



**FLOOR PLAN**  
SCALE:  $\frac{1}{8}" = 1'$



**WET WELL PLAN AT ELEVATION 0.0'**  
SCALE:  $\frac{1}{8}" = 1'$

# CITY OF MILPITAS Engineering Division

**VERTICAL TURBINE STORM WATER PUMPING UNITS  
BERRYESSA PUMP STATION  
PROJECT NO. 8138  
Figure 1 - Site Plans  
May 2005**

